Group B Streptococcus (Neonatal Invasive Disease)

August 2004 Update (page 2)

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Group B streptococci (GBS), or *Streptococcus agalactiae*, are gram-positive cocci. They are divided into the serotypes Ia, Ib, II and III through VIII, based on capsular polysaccharides. Serotype III is the predominant cause of early-onset meningitis and all late-onset infections in newborns.

B. Clinical Description and Laboratory Diagnosis

GBS are a major cause of perinatal bacterial infections, including bacteremia, endometritis, amnionitis, and urinary tract infections in parturient women and systemic and focal infections in infants from birth until 3 or more months of age. Invasive disease in young infants is categorized into two entities based on time of onset after birth. Early-onset disease usually occurs within the first 24 hours of life (range: 0 to 6 days) and is characterized by respiratory distress, apnea, shock, pneumonia, and less often, meningitis. Late-onset disease, which typically occurs at 3 to 4 weeks of age (range: 7 days to 3 months), frequently is manifested as occult bacteremia or meningitis; other focal infections, such as osteomyelitis, septic arthritis, and cellulitis, also can occur. In adults with underlying medical conditions (e.g., diabetes mellitus, chronic liver disease, chronic renal disease, malignant neoplasm, or other immunocompromising conditions), GBS cause sepsis and soft tissue infections. The case-fatality ratio for GBS disease is estimated to be 5-20% for newborns and 15-32% for adults. Diagnosis is based on isolation of *S.agalactiae* from clinical specimens.

C. Reservoirs

GBS are common inhabitants of human gastrointestinal and the genitourinary tracts. Less commonly, they colonize the pharynx.

D. Modes of Transmission

Transmission from mother to infant occurs shortly before or during delivery. After delivery, person-to-person transmission can occur. Although uncommon, GBS can be acquired in the nursery from colonized infants or hospital personnel (probably via hand contamination) or in the community.

E. Incubation Period

The incubation period of early-onset disease is less than 6 days. In late-onset disease, the incubation period from GBS acquisition to disease is unknown. Onset usually occurs from 7 days to 3 months of age, but up to 10% of pediatric cases occur beyond early infancy.

F. Period of Communicability or Infectious Period

The period of communicability is unknown but may extend throughout the duration of colonization or of disease. Infants can remain colonized for several months after birth and after treatment for symptomatic infection. Recurrent GBS disease affects an estimated 1% of appropriately treated infants. Administration of antibiotics in pregnancy is only temporary in eradication of vaginal colonization with GBS.

G. Epidemiology

In the United States, the Centers for Disease Control and Prevention (CDC) estimate the rate to be 4.8-8.5 cases per 100,000 in all ages. There are 17,400 cases of invasive GBS projected in the United States each year, with 1,700 deaths. In the 2000 CDC Active Bacterial Core Surveillance Report, 20% of cases occurred in children less than 1 year old, while the adult (greater than 18 years) cases accounted for 79%. The risk of early-onset disease is increased in preterm infants born at less than 37 weeks of gestation, in infants born after the amniotic membranes have been ruptured 18 hours or more, and in infants born of women with high genital GBS

inoculum, intrapartum fever, chorioamnionitis, or GBS bacteriuria. A low or an absent concentration of serotype-specific serum antibody also is a predisposing factor. Other risk factors are maternal age younger than 20 years and Afro-American race. An average of 20 perinatal invasive GBS infections have been reported annually in New Jersey from 1998 to 2001.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. New Jersey Department of Health and Senior Services (NJDHSS) Case Definition:

CASE CLASSIFICATION

A. CONFIRMED

Isolation of Group B streptococci (*S. agalactiae*) from a normally sterile site (*e.g.*, blood, cerebrospinal, joint, or pleural fluid) in **neonate (e.g., infants up to 28 days of age).**

B. PROBABLE

Clinically compatible case, **AND**

- positive antigen test from cerebrospinal fluid in **neonate.**

C. POSSIBLE

Not used.

B. Laboratory Testing Services Available

The Public Health & Environmental Laboratories (PHEL) will confirm isolates of suspected *S. agalactiae* from appropriate clinical sources and provide serological grouping as needed.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To provide information about the disease, its transmission, and methods of prevention.
- To promptly identify clusters or outbreaks of disease in order to initiate appropriate prevention and control measures.

B. Laboratory and Healthcare Provider Reporting Requirements

The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that laboratories report (by telephone, confidential fax, over the Internet using the Communicable Disease Reporting System (CDRS) or in writing) all cases of isolation of Group B streptococci (*S. agalactiae*) from a blood, cerebrospinal fluid or positive antigen test from CSF **in neonate** to the local health officer having jurisdiction over the locality in which the patient lives, or, if unknown, to the health officer in whose jurisdiction the health care provider requesting the laboratory examination is located. The health care providers must report all cases of GBS invasive neonatal disease to the local health officer having jurisdiction over the locality in which the patient lives.

C. Local Department of Health Responsibilities

1. **Reporting Requirements**

The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that laboratories report (by telephone, confidential fax or in writing) any case of invasive GBS, as defined by the reporting criteria in Section 2 A above to the local health officer having jurisdiction over the locality in which the patient lives, or, if unknown, to the health officer in whose jurisdiction the health care provider requesting the laboratory examination is located.

2. **Case Investigation**

a. It is requested that the local health officer complete a CDS-1 reporting form by interviewing the patient and others who may be able to provide pertinent information. Much of the information required on the form can be obtained from the patient's healthcare provider or the medical record.

b. Use the following guidelines for assistance in completing the form:
   1) Accurately record the demographic information.
   2) Accurately record clinical information, including date of symptom onset, whether hospitalized (and associated hospital information and dates), and other medical information.
   3) Indicate the type of infection caused by GBS.
   4) Indicate the type of specimen from which GBS was isolated/identified (e.g., blood, cerebrospinal fluid).
   5) Note the date of the first positive culture.
   6) If there have been several attempts to obtain case information (*e.g.,* the healthcare provider does not return calls or respond to a letter), please fill out the form with as much information as possible. Please note on the form the reason why it could not be filled out completely. **If CDRS is used to report, enter collected information into "Comments" section.**

c. After completing the form, it should be mailed (in an envelope marked "Confidential") to the NJDHSS Infectious and Zoonotic Diseases Program, or the report can be filed electronically over the Internet using the confidential and secure Communicable Disease Reporting System (CDRS). The mailing address is:

   NJDHSS
   Division of Epidemiology, Environmental and Occupational Health
   Infectious and Zoonotic Diseases Program
   P.O.Box 369
   Trenton, NJ 08625-0369

d. Institution of disease control measures is an integral part of the case investigation. It is the local health officer's responsibility to understand, and if necessary, institute the control guidelines listed below in Section 4, "Controlling Further Spread."

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (N.J.A.C. 8:57-1.10)

None.

B. Protection of Contacts of a Case

Routine cultures of infants to determine colonization with GBS are not recommended. Epidemiologic evaluation of late-onset cases in a special care nursery may be required to exclude a nosocomial source.

C. Managing Special Situations

Nursery

Placing ill and colonized infants in cohorts and the use of contact isolation during an outbreak are recommended. Other methods of control (e.g., treatment of asymptomatic carriers with penicillin) are impractical or ineffective. Routine hand washing by personnel caring for infants colonized or infected with GBS is the best way to prevent spread to other infants.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases in a city/town is higher than usual, or if an outbreak is suspected in a nursery, please contact the NJDHSS Infectious and Zoonotic Diseases Program as soon as possible at 609.588.7500. This situation may warrant an investigation of clustered cases to determine a course of action to prevent further cases. The Program staff can also perform surveillance for cases that cross several jurisdictions, which may be difficult to identify at a local level.

D. Preventive Measures

Chemoprophylaxis

Recommendations for prevention of early-onset neonatal GBS infection are as follows:

- Obstetric care practitioners should adopt a strategy for prevention of early-onset GBS disease, including a screening approach by means of culture or assessing clinical risk factors to identify candidates for intrapartum antibiotic prophylaxis. Recent studies show advantages of the screening approach. Patients should be informed about the available strategies for prevention of GBS.
- Regardless of the prevention strategy used, women should be managed as follows:
  1. Women found to have symptomatic or asymptomatic GBS bacteriuria during pregnancy should be treated at diagnosis. Because such women usually have heavy GBS colonization, they also should receive intrapartum chemoprophylaxis.
  2. Intrapartum chemoprophylaxis should be administered to women who previously have given birth to an infant with disease due to GBS; prenatal culture screening is unnecessary.

For more information about chemoprophylaxis, refer to CDC guidelines: Adoption of perinatal group B streptococcal disease prevention recommendations by prenatal-care providers – Connecticut and Minnesota, 1998. *MMWR.* 2000; March 24, 49 (11); 228-232. Available at DBMD - Group B Streptococcal Disease (GBS) - Additional Information.

ADDITIONAL INFORMATION

The following is the formal CDC Active Bacterial Core Surveillance case definition for GBS. It is **provided for information only** and should not affect the investigation or reporting of a case that fulfills the criteria in Section 2 A of this chapter. CDC case definitions are used by state health departments and CDC to maintain uniform standards for national reporting. For reporting a case to the NJDHSS, always use the criteria outlined in Section 2 A.

Case definition

- A case of invasive bacterial disease is defined as isolation of group A streptococcus, group B streptococcus, *Haemophilus influenzae, Neisseria meningitidis,* or *Streptococcus pneumoniae* from a normally sterile site in a resident of one of the surveillance areas.
- A normally sterile site is defined as: blood, cerebrospinal fluid, pleural fluid, peritoneal fluid, pericardial fluid, surgical aspirate, bone, or joint fluid.
- Tissue isolates known to have been collected during surgical procedures (e.g., muscle collected during debridement for necrotizing fasciitis) will only be considered sterile sites for group A streptococcus.
- Isolation of an organism from middle ear, amniotic fluid, placenta, sinus, or wound should only be reported if the organism is also isolated from a normally sterile site.

Case ascertainment

- Case finding is active and laboratory-based. Because isolation of one of these organisms from a normally sterile site is essential to the case definition, the microbiology laboratories in acute care hospitals and appropriate reference laboratories processing sterile site specimens for residents of the surveillance area are the sources for case identification.

- Data that are essential for describing the population-based epidemiology of these diseases (e.g., age, residence within the surveillance area, outcome) are not available in many microbiology laboratories. Therefore, the case identification is complemented by additional data collection to complete a standard case report form.

REFERENCES

American Academy of Pediatrics. Red Book 2000: Report of the Committee on Infectious Diseases, 25th Edition. Illinois, American Academy of Pediatrics, 2000.

CDC. Prevention of perinatal group B streptococcal disease: a public health perspective. MMWR. 1996; May 31, 45 (RR-7); 1-24.

CDC. Adoption of perinatal group B streptococcal disease prevention recommendations by prenatal-care providers – Connecticut and Minnesota, 1998. MMWR. 2000; March 24, 49 (11); 228-232.

CDC. Active Bacterial Core Surveillance of the emerging infections program network. Emerg Infect Dis 2001; 7:92-99.

Chin, J., ed., Control of Communicable Diseases Manual, 17th Edition. Washington, DC, American Public Health Association, 2000.

Mandell, G., Benett J., Dolin R., Principles and Practice of Infectious Diseases. Churchill Livingstone, 2000.

Schrag, S.J., Zell, E.R., Stat, M., et al. A Population-Based Comparison of Strategies to Prevent Early-Onset Group B Streptococcal Disease in Neonates. N Engl J Med 2002;347:233-239.